AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in the application.

Listing of Claims:

1. Cancelled.

2. Cancelled.

3. Cancelled.

4. Cancelled.

5. Cancelled.

6. Cancelled.

7. (Previously added and currently amended). A method for displaying the three-dimensional vector orientations of magnetic fields on a two-dimensional surface comprising the following steps:

   a. establishing a sampling grid over an area of geological interest having magnetic fields;

   b. locating equally-spaced measuring stations for measuring said magnetic fields on said sampling grid, wherein said measuring stations are designated by the letters;

   c. creating a two-dimensional map of the sampling grid;

   d. obtaining magnetic field measurements at each of said measuring stations and recording the time at which said magnetic field measurements were taken, wherein the magnetic field measurements are represented in three dimensions as Cartesian coordinates X_a, Y_a and Z_a where "a" indicates the measuring station designation, and wherein said step of obtaining magnetic field measurements occurs over a defined period of time;

e. correcting the magnetic field measurements by applying correction means;

f. converting said Cartesian coordinates to mathematical spherical coordinates;

g. applying a color model to said mathematical spherical coordinates wherein said color model creates color hues that are representative of the magnitude and direction of said mathematical spherical coordinates representing magnetic fields at each measuring station; ~~and;~~

h. applying said color model to said two-dimensional map thereby forming a pixilated representation of three-dimensional data to a two-dimensional format(~~.~~) [;]

i. establishing a calibration station using a stationary tri-axial magnetometer for calibrating said magnetic properties, wherein said calibration station is located proximate to said sampling grid, and further wherein the calibration station is located in a magnetically quite area; ~~and,~~

j. conducting a calibration step at the calibration station, wherein said calibration step comprises the steps of:

    i. obtaining a first measurement of the measuring the magnetic field in X,Y and Z directions using said stationary tri-axial magnetometer;

    ii. obtaining a second measurement of the magnetic field in X,Y and Z directions using an operator held portable tri-axial magnetometer;

    iii. determining the effect of said operator holding the portable tri-axial magnetometer on said second measurement; and,

    iv. calibrating said effect to the portable tri-axial magnetometer so that the effect of the operator is nullified(~~.~~) [;]

j. conducting a survey step of obtaining magnetic field measurements at each of said measuring station using a portable tri-axial magnetometer and recording the time at which said magnetic field measurements were taken, wherein the magnetic field measurements are represented in three dimensions as Cartesian coordinates X_a, Y_a and Z_a where "a" indicates the measuring station designation, and wherein said survey step occurs over a period of time;

k. measuring the magnetic field at the calibration station over said period of time and determining an average magnetic field measurement over the period of time in order to obtain a calibration value corresponding to the time that the magnetic field measurements are made;

l. correcting the magnetic field measurements by subtracting said calibration value in order to obtain a calibrated value for each of the magnetic field measurements $X_{calibrated}$, $Y_{calibrated}$ and $Z_{calibrated}$;

m. correcting said calibrated value for each of the magnetic field measurements by subtracting the value of the magnetic field of the earth at each measuring station to obtain a residual value for each magnetic field measurement $X_{residual}$, $Y_{residual}$ and $Z_{residual}$; wherein said value of the magnetic field of the earth is determined by applying the International Geomagnetic Reference Field; and,

n. correcting said residual value by subtracting the values of induced magnetic fields to obtain a remnant value for each magnetic field measurement $X_{remnant}$, $Y_{remnant}$ and $Z_{remnant}$.

8. Cancelled.

9. Cancelled.

10. Cancelled.

11. Cancelled.

12. Cancelled.

13. Cancelled.

14. Cancelled.

15. Cancelled.

16. (Previously added and currently amended). The method of claim ~~15~~ 7 comprising the further step of transferring Cartesian remnant values to mathematical spherical coordinates r_{math}, $theta_{math}$ and phi_{math}.

17. (Previously added and currently amended). The method of claim 16 further comprising the step of translating said mathematical spherical coordinates to geological coordinates r_g, $theta_g$ and phi_g.

18. (Previously added and currently amended). The method of claim 17 further comprising the step of applying a color notation model to each of said geological coordinates wherein said color notation has a direct symmetry to the geological coordinates and so that a unique color hue represents a specific value and direction of a three dimensional vector obtained at each of the measuring station, and further wherein said specific value and direction of the three dimensional vector representing a measuring station is shown as a colored pixel.

19. (Previously added and currently amended). The method of claim 18 wherein said color notation model is selected from a group of color notation models comprising the following color notation models: RGB, CIE, HSV, HSL, CIE XYZ, YIQ, Munsell, TekHVC and CIE LUV.

20. (Previously added and currently amended). The method of claim 19 wherein said unique color hue is overlaid on said two-dimensional map for each of the measuring stations thereby producing a pixilated two-dimensional map of three-dimensional magnetic field data.